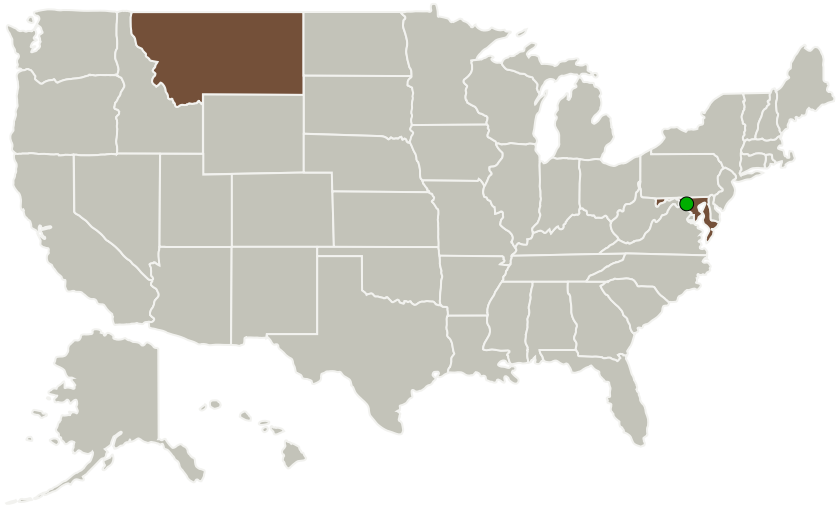
Sensor System for Super-Pressure Balloon Performance Modeling, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Long-duration balloon flights are an exciting new area of scientific ballooning, enabled by the development of large super-pressure balloons. As these balloons represent a new form of balloon technology, it follows that there is much to be learned about how these balloons behave in flight. There is a need to collect data on the balloon platform itself in order to better characterize its in-flight behavior. A lightweight suite of sensors will be developed to quantify several variables affecting the balloon. The measurements will include gas temperature inside and outside of the balloon, balloon film strain and temperature, and the aging of the balloon film. Phase I will involve developing a gas temperature sensing approach, a film strain and aging sensing approach, and an alternate approach to film strain and temperature measurements. Taken as a group, the approaches to be investigated are seen as likely to offer promising solutions to those measurement challenges. They will be tested in the laboratory and in a balloon on the ground. The ultimate result of the project will be a sensor suite that allows super-pressure balloon behavior and flights to be accurately modeled.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Anasphere, Inc.	Lead Organization	Industry	Belgrade, Montana
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Montana

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139443)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Anasphere, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

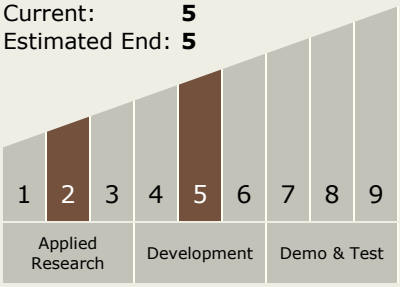
Carlos Torrez

Principal Investigator:

John A Bognar

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.1 Situational and Self Awareness
    - TX10.1.2 State Estimation and Monitoring

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System